Canon Paleo Curriculum
Lesson Plan 6
Unit: 2

Activity Name: Stratigraphic Mapping

Supplies:

- One **Florissant Formation Wall Section** per group
- **Stratigraphic Mapping Worksheet** for each group
- **Stratigraphic Mapping Definitions** for each group
- Rulers
- One color chart for each group
- One grain chart
- Use a geologic reference book for description of rock types

Preparation:

- Print:
    - one **Florissant Formation Wall Sections**
    - one color chart
    - one **Stratigraphic Mapping Definitions**
    - one grain chart for each group.
- Print several copies of the fossil page and cut out each pair. You will hand out the fossil or non-fossil for the layers each group has picked. Se the list below.
- Go over **Stratigraphic Mapping Definitions with the class and the abbreviations they can use on the exercise.**

Concept:

Students will gain an understanding of:

- superpositioning
- how scientists describe layers of earth
- how scientists note the fossil that are found or not found in each layers
- how scientists label or map section of a stratigraphic column

Activity:

Read background materials for Unit 2 to gain an understanding of how the earth has changed and the layers have built up over time.

The teacher will need to divide the students into group.

- divide class into groups of four, they can work together
- have students pick out three layers of the section they would like to describe and start by comparing each layer to the color chart. They do not have match

exactly, we are only using a small portion of the chart geologist use.

- then have students compare each of the three layers to the grain chart.
- have them decide the lithology of each layer
- then measure the width of the each layer

The fossiliferous layer is determined by the teachers(you are the paleontologist who is examining the layer for fossils and will tell the students if they have fossils or not.) After each group has chosen the three layers go around the room and ask them which layers they are working on. Then using the list below to determine which sets of fossils or non-fossils they will receive to describe if the layers is fossiliferous or not.

For the purposed of this exercise, the clay shale have fossils and the sand mudstones and mudstones do not. This not always true though sometimes fossils are not found in the clay shale and sometimes fossils are found in the mudstone. They are hardly ever found in the sandy mudstone.

As students complete the **Stratigraphic Mapping Worksheet** pass out one set (part and counterpart) of either one **fossil** or **no fossil** set to each groups to help the fill out the “Fossiliferous” portion of the Worksheet.

Layer	Fossil (F) or non-fossil (N)
1	F
2	N
3	F
4	N
5	F
6	N
7	F
8	N
9	F
10	N
11	N
12	N
13	F
14	N

Time:
1 hour

Stratigraphic Mapping Worksheet - KEY

Students Name _____**Date**_____

Have the students attach **the Florissant Formation Wall Section** they used to the sheet along with the fossil for your evaluation. Use the key images for the correct answers.

Wall Section

Number of Layer __14.

Pick any three layer, indicate on your Florissant Formation Wall Section what three layers you are measuring. *Note: Give students some leeway on their answers, but they should arrive at answers close to the range in the table.*

Descriptor	thickness	lithlogy	color	bedding	grain
1	8-9mm	CS	GB3	uk -SMS	<.1
2	11mm	SMS	GB3-RB3	CS-CS	.5-1.0
3	16mm-2cm	CS	GB3	SMS-SMS	<.1
4	8-13-mm	SMS	GB3-RB3B1	CS-CS	.5-1.0
5	1mm	CS	GB3	SMS-SMS	<.1
6	1-2mm	SMS	GB3-RB3B1	CS-CS	<.5
7	6-7mm	CS	GB3	SMS-SMS	<.1
8	3-4mm	SMS	GB3-RB3B1	CS-CS	.5-1.0
9	2.5-3 cm	CS	GB3	SMS-SMS	<.5
10	4-4.5cm	SMS	GB2,3,4	CS-MS or CS	I.0
11	3.5-7mm	MS or CS	GB3	SMS-SMS	<.5
12	2.5-3cm	SMS	GB2,3,4	CS or MS -CS	1.0
13	1.3-1.5cm	CS	GB3	SMS-SMS	<.5
14	1.4 -1.7cm	SMS	GB2,3,4B1	CS-UK	1.0

Stratigraphic Mapping Defintions

Characteristics to be described:

Number of Layer - What layer from the bottom of the Column

Thickness – take measurement in millimeters

Lithology – the science of describing the mineral characteristics of rock specimens.
– such as mudstone(MS — thick without layering or sand), sandy mudstone(SMS — sandy mudstone), and clay shales(CS- multiple thin layers of clay), unkown (UK)

Color – use color chart to describe specimen, usually this is done with a Munsell Color chart. For color abbreviations — use red brown(rb), gray brown(gb), etc. and add the number, example rb-4

Weathering – how the rock breaks
- uniform pattern, no uniformity, etc.
- since these are not real samples the aspect cannot be tested in this exercise

Bedding - lamination
- how the unit is layered, above, and below

Grain size - use stratigraphic grain chart to determine size of rock grain

Fossiliferous – does layer contain fossils and describe the type of fossils
- plant, plant and insect, plant debri, etc. (F) No fossil content (NF)

Cement – calcareous or non calcareous
- does it react to hydrochloric acid; does it contain calcium
- if it does react, it reveals the fact that there is limestone in the rock specimen (Note: none of your rock specimens react to the acid)
- since these are not real samples the aspect cannot be tested in this exercise

Symbols for descriptors
- thickness — the measurement in millimeters
- lithology — the type of rock will be one of the three mentions in the Stratigraphic Mapping Defintions
- color — use red brown(rb), gray brown(gb), etc. and add the number, example rb-4
- Bedding — the lithology of the layers above and below the current layer
- Grain size — use the grain chart to determine the grain particles

Fossiliferous — when you passed out the pairs if the student had a fossil in their split rock or not.

Stratigraphic Mapping Worksheet

Students Name _____Date_____

Wall Section
Total Number of Layer

_____

Pick any three layers and indicate on your Florissant Formation Wall Section what three layers you are measuring.

Thickness_____mm
Thickness_____mm
Thickness_____mm

Lithology
1. _____
2. _____
3. _____

Color - name _____number_____
Color - name _____number_____
Color - name _____number_____

Bedding _____
Bedding _____
Bedding _____

Grain size _____
Grain size _____
Grain size _____

Fossiliferous _____
Fossiliferous _____
Fossiliferous _____

Symbols for descriptors

- thickness — the measurement in millimeters
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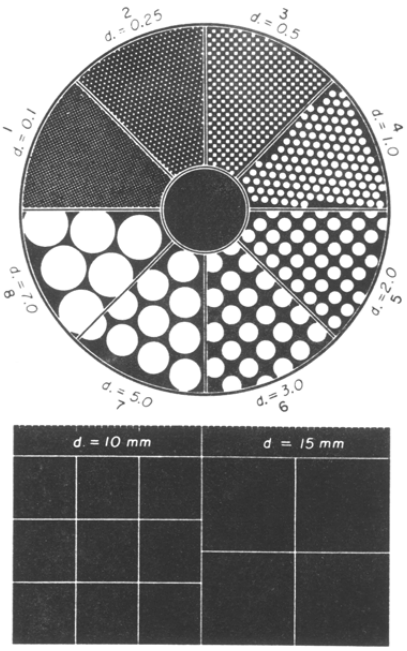
- color — use red brown(rb), gray brown(gb), etc. and add the number, example rb-4
- bedding — the lithology of the layers above and below the current layer
- grain size — use the grain chart to determine the grain particles
- fossiliferous — when you passed out the pairs if the student had a fossil in their split rock or not.

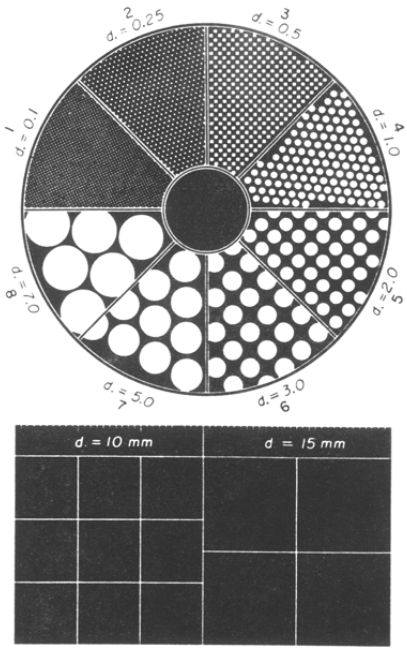
Color Chart


Red Brown
1
2
3
4
Gray Brown
1
2
3
4
Brown
1
2
3
4
Gray
1
2
3
4
Yellow Brown
1
2
3
4
Gray Blue
1
2
3
4



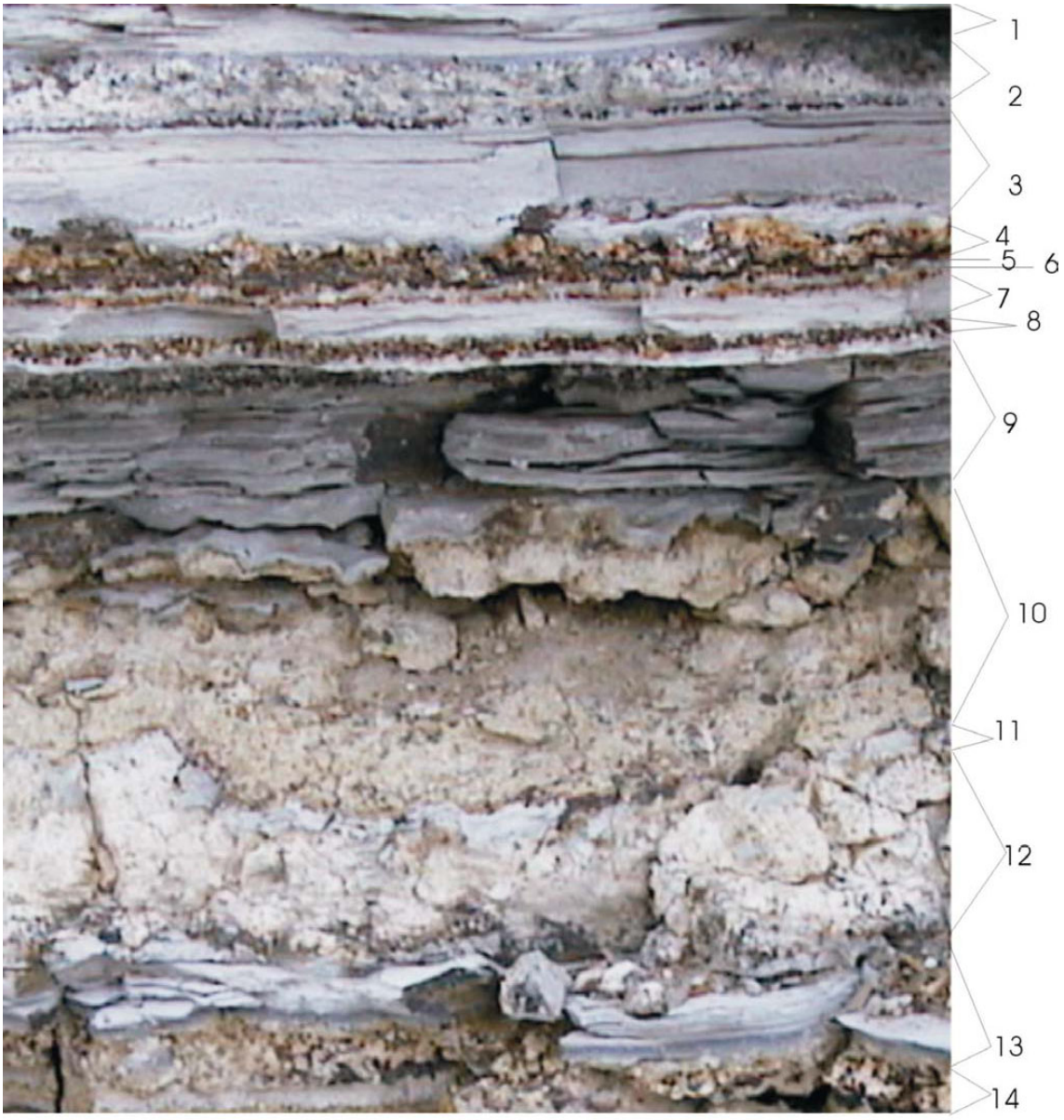
References: (1) George V. Chilingar, 1956, Soviet classification of sedimentary particles and Vasil'evskiy graph: AAPG Bull., v. 40, no. 7, p. 1714. (2) M.S. Shvetsov, 1948, *Petrography of sedimentary rocks*, 2nd ed., 387 p. Gosgeolizdat, Moscow-Leningrad

Grain chart

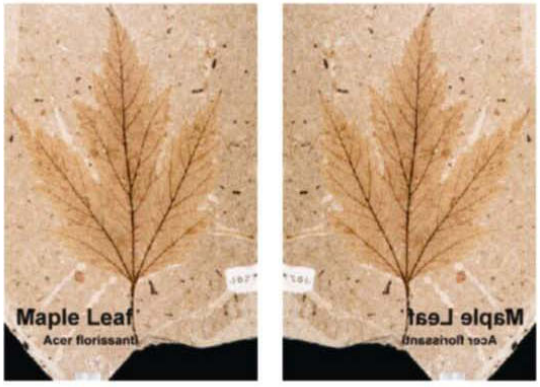


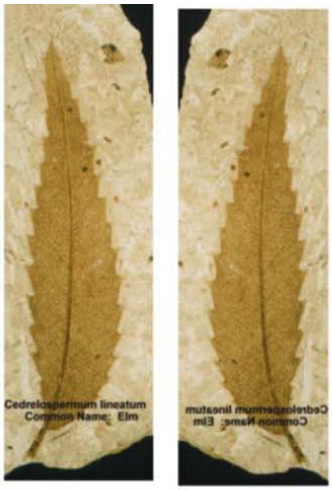
References: (1) George V. Chilingar, 1956, Soviet classification of sedimentary particles and Vasil'evskiy graph: AAPG Bull., v. 40, no. 7, p. 1714. (2) M.S. Shvetsov, 1948, *Petrography of sedimentary rocks*, 2nd ed., 387 p. Gosgeolizdat, Moscow-Leningrad

Grain chart



Florissant Formation Wall Sections





Part and counterpart for fossiliferous test